



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/657,181	09/09/2003	Chun-lun Chiu	CHIU3030/EM	1619

2292 7590 04/05/2006

BIRCH STEWART KOLASCH & BIRCH  
PO BOX 747  
FALLS CHURCH, VA 22040-0747

EXAMINER

LUU, AN T

ART UNIT PAPER NUMBER

2816

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/657,181

Applicant(s)

CHIU ET AL.

Examiner

An T. Luu

Art Unit

2816

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7,9-17 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6,7,9-11,13,14,16,17 and 19-21 is/are rejected.
- 7) ☒ Claim(s) 2,5,12 and 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

Amendment filed 2-28-06 has been received and entered in the case. Claims 1-7, 9-17 and 19-21 are pending. The rejections of claims, presented in the previous Office Action, are maintained.

#### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by the Seong reference (U.S. Patent 5,606,296).

Seong discloses in figure 3 an apparatus comprising a duty cycle converting circuit 301 for receiving a first PWM signal  $V_o$  and then generating a duty cycle reference voltage  $V_{con}$  based on a first duty cycle of the first PWM signal, wherein the duty cycle reference voltage is a one-to-one mapping function of the first duty cycle ( $V_{con}$  is derived from  $V_o$  with respect to  $V_{oref}$ ), and a frequency fixed PWM signal generating circuit (the rest of the circuit), coupled to the duty cycle converting circuit, for receiving the duty cycle reference voltage and then outputting a second PWM signal (PWM output) having a fixed frequency, wherein the second PWM signal has a second duty cycle determined on the basis of the duty cycle reference voltage, and the second duty cycle is a one-to-one mapping function of the duty cycle reference voltage (“PWM output” is derived from  $V_{con}$  and  $V_{tr}$ ) as required by claim 1.

Art Unit: 2816

As to claim 4, Seong discloses the frequency fixed PWM signal generating circuit comprising a frequency controller (100 and 200) for providing a frequency control signal Vtr to determine the fixed frequency of the second PWM signal, and a PWM signal generator 302, coupled to the duty cycle converting circuit and the frequency controller, for generating the second PWM signal in response to the duty cycle reference voltage and the frequency control signal.

As to claim 7, Seong discloses (col. 2, line 64) Vtr being a continuous triangular wave signal.

As to claim 9, Seong discloses in col. 1, lines 14-18, the operating frequencies being beyond tens of kilohertz. As to duty cycle range, Seong implicitly teaches all duty cycle range would be applicable to his circuit since Seong does not set a limit on duty cycle range. Further, the first duty cycle is well within the range of 5% to 95% since figure 4 discloses pulses within the above range (i.e., pulses generated by comparing a target signal with reference signal).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Seong reference (U.S. Patent 5,606,296).

Seong discloses in figure 3 all the claimed limitation including PWM signal generating circuit implemented by a microchip control unit (col. 4, lines 15-18). Seong does not disclose the microchip control unit is set through software program. However, it is common nowadays that software program is used for automation control. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate software program for either automation and/or selecting purpose. Further, a software program is not patentable.

As to claim 20, the scope of claim is similar to that of claim 3. Therefore, it is rejected for the same reason set forth above.

5. Claims 6, 10-11, 13-14, 16, 17, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Seong reference (U.S. Patent 5,606,296) in view of the Hoffman reference (U.S. Patent 5,457,435).

Seong discloses all the claimed invention of claim 6 including a operational amplifier 302 having a non-inverting input terminal connected to the duty cycle converting circuit for receiving the duty cycle reference voltage and an inverting terminal connected to the frequency controller for receiving the frequency control signal as partially required by the claim. Seong does not disclose a resistor having a terminal connected to an output terminal of the operational amplifier such that the second PWM signal is output through another terminal of the resistor as required by claim.

Hoffman discloses in figure 2 a PWM circuit comprising a operational amplifier 224 having an output coupled to a resistor 230 and the PWM signal is output through another terminal of the resistor as required by claim.

It would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Hoffman into that of Seong since a resistor is commonly used to drive a signal.

A skilled artisan in the art would have been motivated to combine the above prior art to shape the PWM signal to a desired level suitable for downstream device of the circuit as required by a particular application.

As to claims 10 and 11, the scopes of claims are similar to that of claim 6. Therefore, they are rejected for the same reason set forth above. It is noted that the limitation “thereby controlling the speed of the fan motor” is seen as “intended use”; and resistor 230 (figure 2) and load 112 (figure 1) of Hoffman are seen as a driving circuit and fan motor, respectively. Also, the recitation of duty cycle and frequency ranges cannot be relied upon to distinguish over the Seong reference because it is seen as intended use (i.e., when the claim is directed to a circuit device, any recitation concerning the input or output signal of such circuit device is not part of the inventive circuit device). Only structural and functional limitations are given patentable weight.

As to claim 13, the same argument for rejecting claim 3 is also applicable herein.

As to claim 14, the scope of claim is similar to that of claim 4. Therefore, it is rejected for the same reason set forth above.

As to claims 16-17 and 19, the scopes of claims are similar to that of claims 6, 7 and 9. Therefore, they are rejected for the same reasons set forth above.

As to claim 21, the scope of claim is the same as combination of claims 10, 11, 13 and 16. Therefore, it is rejected for the same reasons set forth above.

***Response to Arguments***

6. Applicant's arguments filed 2-28-06 have been fully considered but they are not persuasive.

Regarding the rejections of claims under 35 USC 102, Applicant has argued that *Seong* only teaches to maintain the voltage amplitude of the sawtooth wave so as to reach the system optimization and concluded that *Seong* does not teach that the output voltage  $V_o$  is a PWM signal. Examiner respectfully disagrees with Applicant's conclusion pertaining Seong's circuit since Seong teaches to maintain the voltage amplitude of the sawtooth signal so as to the output of the comparator 302, (i.e., a PWM signal), remains stable (See col. 4, lines 6-11). Therefore, Seong does teach to form a PWM signal (PWM output) based on another PWM signal ( $V_o$ ).

***Allowable Subject Matter***

7. Claims 2, 5, 12 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to disclose an apparatus comprising elements being configured as recited in claim. Specifically, none of the prior art teaches or suggests, among other things, the claimed structures of "*the duty cycle converting circuit*" as recited in claims 2 and 12; the claimed structure of "*the frequency controller*" as required by claims 5 and 15.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to An T. Luu whose telephone number is 571-272-1746. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy P. Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.




Art Unit: 2816

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

An T. Luu

3-22-06 *AL*



TIMOTHY P. CALLAHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800